

Margarita), to which this genus appears to be allied; although in *Scissurella* it is not so multispiral. The slit in adult specimens ends in a foramen, and is not continued to the edge of the shell or aperture, as was remarked by the late Mr. G. B. Sowerby, as well as by Philippi, although D'Orbigny (the founder of the genus) did not notice this peculiarity. Mr. Woodward (who called my attention to the circumstance) is of opinion that the fossil genus *Trochotoma* bears a close relation to *Scissurella*. In the Northern Seas, the species appear to inhabit deep water; but in the Mediterranean they are littoral.

Trochus zonatus.—It seems that this name had been preoccupied by Mr. Wood for another species, and I therefore propose to change my specific name to *Skeneoides*.

Jeffreysia opalina.—I have found a full-grown and characteristic example in some shell-sand sifted from seaweed which I collected at Palmaria; thus adding another British species to my list.

58 Montagu Square, 22nd Feb. 1856.

BIBLIOGRAPHICAL NOTICES.

The Natural History of the Tineina. By H. T. STANTON, assisted by Prof. ZELLER and J. W. DOUGLAS. Vol. 1. London. Van Voorst. 8vo. 1855.

IN the days of our great-grandfathers, and for many years later, the naturalist was regarded, even by men of cultivated minds, with a singular mixture of pity and contempt, as something very little better than a harmless madman. Thus the renowned Bickerstaff, in his 'Tatler,' indulges in many curious pleasantries at the expense of the naturalists of his day—*virtuosos*, as he calls them; now giving a ludicrous account of his visit to the "ingenious" Don Saltero, in his coffee-house and barber's shop at Chelsea; now administering a sly poke to the Royal Society; and, lastly, furnishing us with the will of a *virtuoso*, who died in consequence of his exertions in pursuit of a rare butterfly. Forming a collection of insects seems to have been regarded in those days as one of the most contemptible of all employments; and, in fact, the smaller the object studied, the greater was the contempt entertained for the student. Nowadays, however, although there may still be a tendency to worship size and strength in the higher animals, the fact, that amongst the agents employed by Nature none are more active and powerful than those little creatures whose operations are carried on in secret, and whose minuteness often screens their very existence from the eye of the careless observer, long since admitted by philosophical naturalists, is gradually dawning upon the popular mind.

Nevertheless entomology appears never to have recovered entirely from the ill-repute in which it was formerly held; and this is perhaps mainly to be attributed to the fact, that so many of its votaries

regard entomology as consisting in a handsome cabinet with glazed drawers (if made by Standish so much the better), containing rows of good specimens of insects, each with its appropriate label, and feel far greater pleasure in the possession of a rare insect than in the investigation of the most interesting points in the natural history of their favourites. It is no great wonder, perhaps, that ordinary, plain, common-sense people should find some difficulty in realizing the advantages to be derived from the possession of ever so many dry insects stuck through with pins, and thus be led to consider one of the most interesting branches of natural history as a somewhat contemptible study. The existence of this prejudice against the study of entomology may probably be one great reason why this science is so little in repute even amongst professed naturalists; and we believe that nine out of ten of our best zoologists know less of insects than of any other section of the animal kingdom.

The Lepidoptera, more than any other order of Insects, are the objects of the collector's avidity. The beauty of their forms and colours have rendered them the pets of the "fancy," and of those so-called entomologists who deserve no better name, whose sole happiness consists in possession. Indeed, the well-known tendency of evil communication to corrupt good manners prevails so extensively amongst the British Lepidopterists, that it is not easy to find any who are not more or less imbued with what we must call the spirit of "fancy."

It is therefore with no small gratification that we welcome the appearance in the field of a gentleman who is well known as an earnest and conscientious worker, and who now seems determined to show his brother Lepidopterists that the science of entomology is not synonymous with the art of pinning insects. The group selected by Mr. Stainton, for illustration in the work of which the first volume is now before us, is the extensive tribe or family of the *Tineina*, a group of Moths generally of very small size, but frequently of the most elegant forms and brilliant colours, which present more variety and interest in their œconomy than any of the other sections of the order. Until of late years these insects were comparatively little known, the number of species with which the older naturalists were acquainted being very few; and although many species have been described by modern authors, our knowledge of their natural history is still very defective.

The present volume, which is the first of a long series, contains the natural history of twenty-four species, twenty-one belonging to the genus *Nepticula* and three to *Cemiostoma*. In the larva state these insects are all leaf-miners, that is to say, they feed upon the parenchyma of the leaves without injuring the membranes of either surface. The caterpillars of one or two species, however, live in the bark of the twigs of broom. The egg is laid, with very few exceptions, on the lower side of the leaf, and almost always close to the midrib or one of the stronger nervures; and it is remarkable that those moths which deposit their eggs upon the twigs of broom select the side of one of the projecting angles of the stem for its reception. The form of the mine formed by the larva is very variable: some-

times it runs in every direction through the leaf; in other cases it exhibits more regularity in its arrangement, sometimes taking a serpentine form, sometimes running in spirals, or forming nearly concentric lines on the disk of the leaf, whilst the larva of one species follows the edge of the leaf and carries its little mine into every serrature. The caterpillar of one species, which Mr. Stainton calls *Nepticula viscerella*, forms a curious mine, bending upon itself at short intervals, and thus constituting a series of short, parallel, approximated lines. In most cases the larva has a tendency to enlarge its mine towards the extremity, and thus, when the creature is nearly mature, its dwelling usually forms a broad chamber or blotch beneath the surface of the leaf.

Notwithstanding the apparent convenience of this dwelling-place for the purpose of undergoing its metamorphoses, the caterpillar generally quits its little burrow before passing to the pupa state; and when the time for this operation has arrived, it eats out of the upper surface of the leaf, and spins a beautiful silky cocoon on the footstalk, or the stem of the plant, or even amongst leaves on the ground, where it awaits its further changes. The first-mentioned position is usually adopted by those species which appear in the perfect state in the summer months, whilst those which pass the winter in the pupa state select one of the two latter situations: and it is remarkable that of those species of which there are two broods in the year, the larvæ of the summer brood spin their cocoons on the footstalk of the leaf; whilst those which change to the pupa state in autumn, and pass the winter in that condition, resort instinctively to the protection afforded by the stem of the plant, where they usually place themselves under a projecting bud or twig, for shelter from the inclemency of the winter. When the moth is ready to make its appearance, the pupa pushes its head through the cocoon, and the elegant little creature is thus enabled to spring at once into the air, without struggling through the silky meshes of its dwelling, a proceeding which would probably do no little injury to the delicate scales with which its wings are covered.

Such is the general history of the twenty-four Moths described by Mr. Stainton in the present volume, and probably that of many others, as there are still several species belonging to both these genera with the œconomy of which our author is not acquainted. We must regret that Mr. Stainton has not given us something of this kind in the introductory remarks on each genus, as he could have done it so much better; and it would also have saved him the trouble of repeating the greater part of these particulars in his account of each species, a proceeding which certainly adds unnecessarily to the extent occupied by their history. Indeed it cannot be too much insisted on in these days, when we are so overwhelmed with works on natural history that it is almost impossible to keep pace with the progress of even a single branch of the science, that the author who presents us with the greatest amount of information in the smallest possible space is the one who must be regarded as doing the best service to the cause he professes to have at heart; and we are therefore sorry to see that Mr. Stainton, whose earnest desire for the

advancement of Entomology is evident in every page of this book, has divided his history of each species into numerous sections, in such a manner as to extend the space occupied by each to a very unnecessary length, especially in conjunction with another feature, to which we shall refer hereafter. Thus, for example, we have paragraphs under the following titles:—"How noticeable,—Larva ;" "How noticeable,—Imago ;" and then "Mode of Life," the latter containing everything necessary to be known in the two preceding sections, which might certainly be dispensed with, at a saving of about a page to each species, and a corresponding advantage to the student. Again, we cannot see that the observations placed before the synonyms of each species are distinct in nature from those frequently placed after them, although arranged by our author in separate sections, under the titles of "Synonymy" and "Remarks on the Synonymy ;" and we cannot but think therefore that it would have been far better to have amalgamated these remarks under one head.

It will be seen that the above objections apply solely to the plan which Mr. Stainton has seen fit to adopt in communicating his results to the world, and have therefore nothing to do with the intrinsic excellence of his book ; nay, this very profusion of labour in the literary department of the work may be taken as an earnest that there has been no lack of energy and perseverance in the prosecution of the preliminary investigations. Indeed, the copious information furnished in Mr. Stainton's book upon every subject connected with the history of these Moths leaves nothing to be desired in this respect ; and the eight admirable plates with which it is illustrated furnish capital and most characteristic representations of the Moths, with their larvæ, the mines of the latter, and the cocoons in which the pupæ pass their period of inactivity. The first four of these plates were drawn and lithographed by the late lamented Mr. Wing, whose name is a sufficient pledge for their excellence, and some of the drawings for the remaining plates were also done by him ; these have been completed by Mr. C. W. Wing and Mr. Ford, and are also exceedingly good, especially those by the latter artist. Some idea of the industry exerted in working out the natural history of the species may best be gained from the fact, that in some cases these little caterpillars, measuring about 2 lines in length, are taken out of the galleries to sit for their portraits, and restored again with such care to their natural position, that they return at once to their ordinary employment of eating, and finally make their appearance in the perfect state, probably to figure in one of the innumerable pages of the 'Zoologist,' as what Mr. Kingsley would call "another thought of the divine mind rescued from Hela." But we must proceed to the consideration of another curious and important feature of this book, which certainly exhibits an unusual boldness of design throughout.

Ever since Ehrenberg discovered that it was impossible to represent Infusoria properly except upon elephant folio plates, it has become more or less the fashion amongst zoologists to consider that the size of works on natural history should be in an inverse ratio to that of the objects treated of. Our author appears to have adopted this principle, and although he does not attempt to rival the learned Pro-

fessor of Berlin in the perpendicular dimension of his work, he certainly shows himself determined to expand most portentously in a horizontal direction. Thus the present volume is the first of a *first series of ten*; it contains, as we have already stated, the history of only twenty-four species of these little Moths; and as, according to his own statements, there are now known no fewer than six hundred species of *Tineina*, we may presume that the work, when complete, will extend to at least five-and-twenty volumes,—a small library in itself.

The process by which Mr. Stainton proposes to fill this enormous space is the same as that adopted by Prof. Ehrenberg for the same purpose, but he has improved upon the original notion. Ehrenberg wrote his book in three languages, German, French and Latin, probably neglecting the English as unworthy of his notice; but Mr. Stainton, writing for the world in general, but for Englishmen in particular, has naturally added English to his list of languages, and his book appears as though intended for the original builders of Babel before they had had time to learn each other's dialects. We are aware that there are such things as Polyglot Bibles, and doubtless theological students may find them advantageous in giving different readings of the same passage; but no such benefit would attend the publication of *Biblia Naturæ* on the same principle, and considering the stature to which they might attain in one language, we have no wish to see them published in half a dozen.

In Ehrenberg's case there was indeed some excuse for the adoption of this plan, as he was putting forth new and startling views, of the truth of which, false as they have since been proved, he probably entertained no doubt, and he might therefore be forgiven, if, with the view of removing every chance of ignorance of facts which he justly thought would change the face of science, he rendered his work more voluminous than it might otherwise have been. But in the present work we can see no such pressing necessity for a polyglot text, whilst, on the other hand, its disadvantages are sufficiently obvious. The bulk of the work is increased to more than four times what is necessary, and we feel convinced that by this expenditure of labour Mr. Stainton will not add greatly to the number of his readers. In the present case any continental entomologist, who, to apply the popular classification of gentlemen, is an entomologist, ought certainly to possess sufficient English to enable him to read this book; and as for those who are in the opposite predicament, we suspect it will not be easy to make them believe that there can come any good thing out of England.

It may be thought that these remarks are somewhat ungracious, inasmuch as Mr. Stainton tells us in his preface that this multiplication of the work adds nothing to its price, which merely represents the cost of the plates, and that the book would not have cost a farthing less, if not only the foreign text, but the whole of the letter-press had been suppressed; and truly entomologists have to thank Mr. Stainton for this liberality; but our object in the above observations has been to put it fairly before the author, whether, if he designs making a present to the entomological world, it might not be possible

to find one of a more practical character. Nay, we are not sure that the very means adopted by Mr. Stainton to provide for the greater diffusion of his work, may not be found in reality to impede its progress, for many a one seeing a book advertised as in four languages, and ignorant of the peculiar circumstances under which it was published, would be inclined to say to himself,—“I should like it well enough in English, but I don't want a parcel of stuff I can't read.”

If, however, Mr. Stainton is resolved, for the sake of uniformity or otherwise, to persist in the adoption of the tetraglot plan, we should certainly recommend him to print his books in four parts corresponding with the four different languages. The present columnar arrangement of the book renders it rather disagreeable to read, as the matter referring to each species, instead of being condensed into two or three pages, is spread out over eight or twelve; and the only advantage we can see in this arrangement is the same as that of the polyglot bibles already alluded to, namely that of furnishing different readings of the same passage. We must confess that we have found this conducive to a more correct understanding of our author's meaning in one or two cases; but nevertheless it is hardly a reason that a writer would urge on his own behalf, and is certainly to be deprecated for the sake of science.

We trust that Mr. Stainton will take the remarks which we have felt called upon to offer, in good part. They have been made entirely from a feeling that energy and perseverance employed in what we consider the unnecessary expansion of a book are to a great extent thrown away, and in the hope that, being made in no unfriendly spirit, they may induce him to take the matter again into consideration before the publication of the next volume of his valuable and interesting work.

Sylloge Generum Specierumque Cryptogamicarum quas in variis operibus descriptas iconibusque illustratas, nunc ad diagnosim redactas, nonnullasque novas interjectas ordine systematico disposuit C. MONTAGNE, D.M. &c. Paris, 1855. 8vo, pp. xxiv & 498.

It is now some five-and-twenty years since Dr. Montagne retired from his labours as Chirurgeon Majeur, and settled at Paris, which was, we believe, the place of his nativity. On his return he found that cryptogamic botany was almost entirely neglected in France, and that the collections made by expeditions sent out into various parts of the world by the government were forwarded to foreign botanists for determination. He had been long attached to botany, and had made considerable collections of phænogamic plants, and he at once formed a resolution that this reproach should no longer be chargeable against his countrymen, and he therefore applied himself diligently to cryptogamic botany. The time was well chosen in many respects, and fortunate in the great improvements which had lately been made in the microscope. There was ample room therefore before him for discovery, and in his own country he found abundant new matter for investigation. With active habits he combined considerable knowledge of various kinds; and his talent as a neat and accurate draughtsman came greatly in aid of his other acquirements. His paper on

the novelties in the Cryptogamic flora of France was justly admired, and he soon became known as the great medium of correspondence at Paris on every subject connected with that branch of botany to which he had determined to consecrate his labours. Materials rapidly increased upon his hands, the consequence of which was, that month after month there was a constant flow of new and interesting intelligence from his pen. This, from the very nature of the case, is scattered up and down through a multitude of works of various descriptions, many of them exceedingly voluminous and costly, and they are therefore inaccessible to a great portion of those who wish to consult them. By the advice of Professor Fries, he has therefore determined to collect diagnoses of all the new species which he has published, and they are now united in a handsome volume, accompanied by copious indices, and enriched here and there with interesting notes.

The following extract relative to the motion of *Diatomaceæ* is an example of the sort of matter with which the technical characters are here and there interspersed. In describing a new species of *Navicula*, which forms a part of the organic matter which occurs in the waters of Vichy, he takes occasion to give an extract from a letter of M. Petit :—

“The motion of these *Naviculæ* is well worth attention. It is more or less decided according to the degree of their development. In their more or less rapid progress across the field of view, they appear to have a certain degree of consciousness, so as to avoid any obstacles with which they meet. They advance for the purpose of investigation ; they try them with one of their extremities ; but they appear to do this with a certain degree of precaution. It seems as though they smell at these obstacles, that they examine them, and try means of avoiding them.

“I may add, in reply to one of your observations, that I am quite certain that the movements of these little creatures do not depend on currents arising from the evaporation of the fluid on the stage, or from any other physical cause, of which it is easy, with a little attention, to convince oneself. These movements are certainly self-dependent ; for the creatures wander in different, and frequently opposite directions ; and they consist not simply in an agitation without object, but seem to be directed by a sort of instinct. On carefully watching them, we see them turn round obstacles, when they cannot pass above or below them. Sometimes, when they are entangled in a mass of dead organic matter, they put it in motion by their struggles to extricate themselves. You may therefore consider as certain all that I tell you about the spontaneous motions of our *Navicula*, which I scarcely regard as a vegetable.

“This morning I have shown the motions of the *Ulothrix* and *Navicula* to Dr. Seguin, who is used to the microscope, and was much struck with them. He has verified all the information which I have sent you.

“I said in my first letter, that we meet sometimes with large quantities of little *Naviculæ* not yet, as it appears to me, completely developed, and which have not at that time the lanceolate extremities. In this state or stage of growth they possess no motion, which they acquire in proportion as they increase in size, and do not possess

their full activity till they have arrived at maturity. What surprises me is, that in spring I find a much larger number than I find now (September). I see none, for instance, in a state of infancy. I may add, that in spring it is principally in a kind of reddish scum, which accompanies the green matter, that I meet with the greatest number of *Naviculæ*, and that now I find less of this scum, which perhaps depends upon the fact that the water in the basin is more agitated in summer,—a time when the water is incessantly pumped up for invalids.

“As regards the marginal striæ, I offer the following remarks:—M. Quatrefages, who has been at Vichy for his health, examined the Algæ with me, and has endeavoured to discover if the *Naviculæ* really possess these striæ. By the help of oblique illumination, we have clearly established their existence, at least in some individuals. We are not certain that they are present in all, for on some we have seen them distinctly on one side only and not on the other, while in other individuals we have not been able to discover them on either. I cannot doubt then, that at least a certain number of *Naviculæ* do not present striæ, though they are perceptible sometimes on either margin, sometimes on one only. M. Quatrefages, equally with myself, has observed the movements which I have described. Finally, the endochrome in the living organism is not green but yellow, exactly, in fact, as you see it in the dead specimens.”

Hoping that the worthy author will be indemnified for the considerable outlay which the publication must have cost him, we commend this work to the attention of our botanical friends.

PROCEEDINGS OF LEARNED SOCIETIES.

ZOOLOGICAL SOCIETY.

March 13, 1855.—Dr. Gray, F.R.S., Vice-President, in the Chair.

AN ARRANGEMENT OF THE FAMILIES OF ECHINIDA, WITH DESCRIPTIONS OF SOME NEW GENERA AND SPECIES.

BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., P.B.S. ETC.

MM. Agassiz and Desor have given the generic characters and a list of the species of *Echinida*, but do not divide the genera of the normal division into families. I propose to divide them into the following groups.

The *Echinida acrocystos*, or those which have a vertical dorsal vent, a regular globular body, with an inferior central circular mouth, armed with conical jaws, furnished with five elongate acute teeth, and with the ambulacra forming continuous vertical bands from the mouth to the vent. They may be divided into the following families.

I. *Tubercles of spines perforated; spines elongate; body circular.*

Fam. I. CIDARIDÆ.

Ambulacra narrow, formed of double pores; interambulacral plates few, with a single large tubercle; spines thick, solid.